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As more and more people turn to the Web for information about companies and their products and services, the quality of organizational Web pages becomes increasingly important. This research study utilized semi-structured interviews with ten university students viewing the home pages of six company Web sites to analyze factors influencing home page usability. In particular, the study was designed to understand how users interact with information elements such as text, graphics and navigational links as they seek to orient themselves with a Web site and the sponsoring organization. The results indicate that the company logo, a brief explanation of company purpose and minimal amounts of text are some of the things that users want most from corporate home pages. To improve user perceptions of site usability, home pages should prominently display broad categories of navigation options, with more detailed lists readily available. In addition, graphics and colors should be carefully coordinated to affect positively user attitudes towards the site and sponsoring organization.

Headings:

World Wide Web – Home Page

World Wide Web – Usability

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THE ROLE OF WEB HOME PAGE INFORMATION ELEMENTS
IN USER-SITE ORIENTATION EFFORTS

by
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Introduction

As more and more people turn to the Web for information about companies and their products and services, the quality of organizational Web pages becomes increasingly important. Companies need to provide the information their customers and potential customers are seeking in a manner that is convenient and usable for those customers. Much research over the past few years has focused on developing more usable Web sites to improve the user-site interaction experience, but not as much has addressed the issues unique to arguably the most important page on a Web site: the home page. This paper reports on a study that examined the home pages of six company Web sites to determine the factors affecting usability on a site's main page.

While home pages themselves rarely contain the all-important content that visitors are seeking when they come to a site, home pages are the front door and entryway into the building, so to speak. As such they provide an introduction and greatly influence the first impressions visitors may have of both the site and the sponsoring organization. Considering that in many cases a person's first interaction with a company may be on its Web site, considerable effort should be directed towards developing the right first impression. This involves more than establishing brand image. It means creating a highly usable home page that answers the basic questions visitors have when they arrive at a new site and points them where they should go to find answers to their more pressing questions.

The study detailed in this paper analyzed the way participants interacted with home page information elements, such as text, graphics and navigation links, to gain a sense of orientation with the Web site and its sponsoring organization. What follows are discussions of relevant literature, the research questions driving the study, methods used, and results.

Relevant Literature

Despite the fact that the home page is often the first encounter a user may have with a site, little research has focused on home page usability. However, a good number of experts do offer guidelines, most of which appear sound and reasonable. This section reviews the literature covering home page design, various relevant concepts, information elements and other issues affecting usability.

Home Page Design

Experts agree that a home page must orient the user to the site and the sponsoring organization, communicating, almost instantly, what that site is about and what kinds of information can be found there or what types of tasks can be accomplished there (Krug, 2000; Mack, 2000; Nielsen, 2000b; Singh & Dalal, 1999). Krug suggests that opportunities for user frustration and misinterpretation increase if users cannot quickly identify a site's sponsor and content. The placement at the top of the page of a fairly large version of the organization's logo and/or name is a practice advised by most experts (Nielsen 2000b; Krug 2000). Further, Krug asserts that the use of a "tag line" sentence or very brief "welcome" paragraph, clearly stating the value the site offers to visitors, will help in the orientation process (see also Choate, 2000).

Singh and Dalal (1999) posit that home pages essentially are the most important on-line advertisements, having the goal of informing and persuading users to view an organization and its products and services favorably. Indeed, they suggest that visitors regard home pages as advertisements designed to draw them into the site. Home pages, the authors assert, must create awareness and impressions while shaping beliefs and knowledge. Their research suggests that users' attitudes towards a home page are significantly correlated with their attitudes toward the sponsoring organization. Thus, regardless of whether or not users ever move beyond the home page, it should positively shape their attitudes toward the organization and its brands. They suggest that an emotional appeal is more appropriate for a home page, while a rational appeal might work better for interior pages.

However, if the home page is viewed as an advertisement, care must be taken not to overload the page with marketing-oriented language and sales pitches. Most advice and research show that users seek and are drawn in by compelling content but turn away from sites which seem overly promotional (e.g., Keevil, 1998; Nielsen, 2000b; Warth, 2000).

In effect a home page, to be usable, must quickly answer several questions including “Where am I?”, “What can I do or find here?” and “Why should I be here and not somewhere else?” (Krug, 2000; Nielsen, 2000b). The more clearly and succinctly a home page answers these questions, the more likely it is to draw users in (provided the content is of interest) and reduce frustrations and misinterpretations. The present study seeks to identify the ways users go about answering these questions and the factors that help or hinder the process.

Relevant concepts

Several concepts dealing with the usability of electronic environments are helpful to consider when evaluating the usability of Web home pages and the relationship of the home page to internal pages. Three of these concepts—information scent, affordances and cultural conventions, and perceived usability—are discussed in turn.

Information Scent. Information Foraging theory defines information scent as the degree to which a user can infer the location of a target from indications in the interface (Pirulli & Card, 1995). Visitors to a Web site use various information elements, such as hyperlinked category labels, graphics and textual descriptions, to assess the content of the site and how that content can be reached. Information scent is not absolute and objective, but rather the subjective perceptions of individual users as they judge the value of and/or path to information (Chi, Pirulli & Pitkow, 2000). In a study of nine Web sites, Spool et al. (1999) found that the more successfully users could predict where a link would lead, the more successfully those users could find information.

Clear, distinct category labels and page headings enable users to find information quickly (Mack, 2000; Nielsen, 2000b). In one study by Larson and Czerwinski (1998), users searched for information using different hierarchical structures. Some of the users' successes were attributed to distinct top-level category labels, which helped users begin their browsing on the right paths.

Jones (1999) suggests that users are more encouraged to explore a site when hyperlink labels are explicit and clear. Haas and Grams (1998) performed a content analysis of 75 Web sites and their links to develop a taxonomy of link types. Their findings suggest that designers and users of Web pages may be more likely to share a common view of some types of links than of others. They also found that noun phrases play a significant role as link anchors. They suggest that the destinations of links comprised of proper nouns would be more uniformly interpreted than those made up of URLs or common nouns.

One factor that may hinder perceptions of information scent is the presence of excessive peripheral content, which Maglio and Campbell (2000) describe as information not critical to a user's task. Peripheral content may clutter up the screen, distracting the user from the options that are central to his/her search and blurring the lines between those options. The benefit of displaying peripheral content is that it may help with secondary tasks and expose users to additional features of the site. Nielsen (2000b) encourages the restrained use of news and special features on the home page as these are rarely the objects users seek when coming to a Web site. Organizations must balance the desire to introduce site visitors to new content with efforts to preserve clear information scent.

Affordances, cultural conventions and constraints. Since Norman (1988) introduced the idea of "perceived affordances" to human-computer interaction designers, many experts have championed the concept (e.g., Cooper, 1995; Krug, 2000). All objects by their designs afford certain actions. However, the user's perception of what actions are possible is more important to the designer than what actually is possible. Fitzgerald and Goldstein (1999) offer a taxonomy of things that objects should honestly communicate about their affordances. In particular, they warn against creating false impressions that may be the cause of much user dissatisfaction and frustration.

More recently, Norman (1999) argues that many of what designers refer to as affordances are actually cultural conventions and constraints. These are expectations, shared by a group, of what a given object represents and how it may be used. Conventions and standards provide Web users with a sense of the familiar, helping them quickly and accurately to interpret

what they see and know how to respond. When objects do not conform to cultural conventions and constraints, users are left confused and irritated. Krug (2000) argues that sites should be designed to be “self-evident” or, at the very least, “self-explanatory” so that users’ cognitive burdens are not increased as they try to interpret how to use a site. This frees them, enabling them to focus on achieving their goals.

In a study of first time users of digital library interfaces, Neumann and Ignacio (1998) found that users classify a new system based on interactions with previous systems and then expect the new system to behave similarly to others in that class. When users were unable to make a match between a new system and one they had previously experienced, they were more likely to become frustrated or confused. The more comfortable they were with a system, the more likely they were to experiment and explore. The implication for Web sites is that new users of a site may compare it to other sites they have visited and then expect it to be organized and work in a similar manner. Do users have specific expectations of a site once they classify it as an e-commerce site? Do they expect certain conventions to be followed by all sites in a given industry? If so, these answers certainly would have implications for designers.

Home pages, like all Web pages, should, for the most part, conform to cultural conventions and constraints to help users as they seek to accomplish their individual goals. Objects on the page should present their affordances in such a manner that visitors may perceive them easily and accurately. In addition, we might think of the home page, in its entirety, as affording a glimpse of the purpose and content of the site. As such, one quality of a highly usable home page would be that of enabling the user to perceive the purpose and content of a site and sponsoring organization in a quick and accurate manner. The use of cultural conventions and constraints, including design styles and organizational structures common to certain classes of sites (if users perceive these to exist), should help sites achieve this quality.

Perceived usability. Based on their research of users’ *a priori* perceptions of the usability of an automatic teller machine interface, Kurosu and Kashimura (1995) coined the term “apparent usability”, which they then compared with the interface’s “inherent usability” (i.e., actual usability). Their results showed little correlation between apparent and inherent usability. However,

apparent or “perceived” usability is an important concept to consider nonetheless, since a user’s perceptions of the usability of a site may well affect his/her willingness to explore it. Regardless of how usable a site actually is, if users do not perceive it to be easy-to-use they may be unwilling to use it. Sears, Jacko and Dubach (2000) argue that a better understanding of the factors influencing perceived usability is needed. In their study of American and Swiss users’ reactions to two different versions of the same Web site, they discovered that basic demographic user characteristics (e.g., age and gender) were more closely correlated with perceived usability than were other characteristics such as computer and Internet experience or frequency of use. In general they found that females perceived sites to be more usable than males did, while older participants tended to perceive sites as less usable than did younger ones.

Information elements

Any attempt to understand the factors affecting the usability of a Web page must take into account the roles played by various items that we may term information elements. These are on-screen objects which designers use to inform and persuade users, and which users look to for an understanding of site purpose, content and organizational structure. For the purposes of our examination, we will consider three broad categories: text, graphics and links. These categories are not mutually exclusive since, for example, an image may be both a graphic and a link. However, they do provide a coherent way of considering everything on the screen.

Text. Nielsen (2000a) cites a Poynter Institute study that confirms results from his own research showing that users tend to look at text before graphics. According to Nielsen, the Poynter Institute study found that for 78% of the users their first three eye fixations were on text, compared with only 22% on graphics. It may be that users find text more informative than graphics or easier to interpret.

Nielsen frequently stresses that people read differently in an electronic environment than they do in a paper environment (e.g., 2000a; 2000b). On-line, people only skim text. They search for key words to pick up on concepts and ignore details. Only when they find something of interest will they read more deeply. Even then, his research shows they rarely read more than

two-thirds of the text. The sparing use of text, especially on the home page, is a tactic commonly advised in the literature (e.g., Krug, 2000; Nielsen, 2000).

Graphics. Most commercial sites include graphics of some sort for various reasons including aesthetic concerns and branding. From a usability perspective, the question, is how do these graphics affect the user's effort to become oriented with the site? A number of experts have suggested that aesthetics may actually distract or confuse users, hindering usability (e.g., Marcus, 1992; Norman 1988). However, some research seems to suggest that the presence of graphics on a Web page may enhance the quality of that page in the eyes of users. In a study comparing the abilities of link-based metrics and content-based metrics to predict Web page quality, Amento, Terveen and Hill (2000) found that, among other content-based elements, the number of graphics on a Web page was positively correlated with user judgments of the quality and authority of that Web document.

Nielsen (2000b) says that response times are the most important of all design criteria. Since graphics negatively affect download times, he recommends pages at higher levels of the site hierarchy have fewer graphics. As users are willing to traverse to lower levels of the sites, their interest in the content is greater and their willingness to endure any download times associated with graphics increases.

Sears, Jacko and Dubach (2000) studied the effects of "high end graphical enhancements" (such as graphical buttons and animated graphics) on American and Swiss users' opinions of two versions of the same Web site. One version included the graphics. The other did not. The study participants perceived the sites which included graphical enhancements to be both easier to use and more attractive. The authors suggest that graphics that assist in navigation are better than those that do not. However, they found that the overall appeal of a Web site was determined less by the presence of such graphics than it was by basic user demographics such as age and gender.

Several studies have found a close correlation between perceived usability and user judgments of aesthetics (e.g., Kurosu & Kashimura, 1995; Tractinsky, 1997). Tractinsky suggests that this relationship would likely have a significant impact on system acceptability and users'

long-term attitudes toward the system. However, as further evidence that perceived and actual usability are not correlated, Spool et al. (1999) found no relationship between graphic design and information seeking success rate.

While graphical enhancements may be important for developing perceived usability, building brand image and creating an image of quality and authority, excessive use of such elements may hinder actual usability, driving potential users away. A better understanding of user reactions to and use of graphics on a Web home page, may lend greater insight into the role these objects play in the process of orientation.

Links. Links are the textual and graphical navigation options offered to site visitors. These options indicate where a visitor can go and offer some insight into content. Research has shown that as users view links, they form some expectation as to where the links will take them (Spool et al., 1999). For this reason, links should be clear and unambiguous. In particular, research suggests that main navigation options should be very closely tied to site content (e.g., Bachiochi et al., 1997, Spool et al., 1999).

Spool et al. (1999) found that most users examined and preferred textual links to graphical links and that graphical links are only loosely correlated with information seeking success rate. However, all types of textual links are not equally helpful to people searching for information. Embedded links, textual links surrounded by non-linked text, proved to be negatively correlated with information seeking success rate.

In addition to the choice of link type, a further consideration is the optimal number of links to be displayed on the home page. While there exists no perfect number for all sites, there is evidence to suggest certain hierarchical structures are better than others. Some research suggests that excessive linking leads to increased user cognitive load and hinders performance (e.g., Nielsen 1993, 2000b; Spool et al., 1999). Larson and Czerwinski (1998) offer an informative review of the research in the area of menu structure breadth versus depth. They then report on results from their own study, which reveal there may be a preferable “middle ground”. Users’ information seeking performance fared the worst in the menu structure with the least breadth (fewest options at the top and subsequent levels) and greatest depth. However, the results also

suggest there may be a threshold beyond which increased breadth leads to increased disorientation and decreased user performance.

All of this would suggest that the most effective link options on a home page would be textual, closely tied to site content and numerous enough to provide clear distinction between options, but few enough to avoid taxing user memory.

Other issues.

There has been a call for research to focus on generic tasks common to most Web sites (Lee, 1999). In the realm of corporate and e-commerce Web sites, two basic user tasks are not well supported: finding contact information (Thury, 1998) and locating information on employment opportunities ("Does Your Company's", 2000). In addition, experts agree that content is the main reason users visit Web sites and what they want to find more than advanced technologies and high-end graphics (e.g., Fogarty, 2000; Nielsen 2000b; Spool et al., 1999).

In short the guidelines and research evidence available in the literature would suggest that the home page of a large Web site should clearly notify visitors of where they are and what they can find on the site. In addition, the home page should create positive impressions of the company and draw visitors into the site. All of this can be accomplished through the strategic use of information elements. Text, in sparing amounts, should identify the purposes of the site and sponsoring organization. Graphics can be employed to improve user perceptions of the quality, attractiveness and usability of the site. However, selection of graphics must be moderated by download time considerations. Navigation links should be distinct and unambiguous, helping visitors to identify the breadth and depth of site content.

Research Questions

The present study was designed to provide a better understanding of the ways home pages affect users' efforts to orient themselves with a site and the sponsoring organization. In particular, the goal was to identify the roles various information elements play in this process of orientation. Nielsen's (2000b) and Krug's (2000) lists of questions a home page should answer (e.g., "Where am I?" "What can I find/do here?" "Where do I start?" etc.) guided the research

design to the end that the study intended to provide an understanding of how users interact with information elements on the home page to answer these questions. In addition, since the home page is, in many cases, the first exposure users may have, not only to the site, but also to the sponsoring organization, the study also sought to identify how interaction with the home page affects the user's perceptions of the organization.

Methods

This study utilized semi-structured interviews to gather qualitative data from 10 participants regarding their opinions, thoughts and reactions as they interacted with the home pages of six different business Web sites. The content of these interviews was then analyzed to uncover common patterns among the ways those individuals use the information elements on the home page to gain an understanding of site content, organization and sponsor. The following sections describe and discuss participant selection, site selection, the rationale behind the interview structure and questions, and the data analysis procedures.

Participant selection

Participating in the study were 10 students from the University of North Carolina at Chapel Hill. Table 1 provides specific data on the characteristics of each participant.¹ Seven were undergraduates, and the remaining three were in graduate-level or professional programs. Six of the participants were majoring in business while the rest were studying a variety of majors. Participating were three males and seven females, most of which were in their early twenties. The majority had been using the Internet for between three and four years and reported that they used the Web an average of one to one and a half hours each day. This sample represents a fairly well educated, Internet-savvy group of individuals with a somewhat diverse set of interests.

¹ Where participants have been quoted in this paper, their names have been changed to protect their identities.

Table 1***Participant characteristics***

Participant*	Gender	Age	Status	Major	Web Experience (years)	Web Use (hours per day)
Aaron	M	21	Undergraduate	Business	5.5	2
Beth	F	20	Undergraduate	Business	2.5	1
Celine	F	21	Undergraduate	Business	6	1
Debbie	F	21	Undergraduate	Business	4	1
Eric	M	21	Undergraduate	Business	3	1
Fred	M	21	Undergraduate	Business	4	1
Geena	F	21	Undergraduate	Journalism	5	2
Heidi	F	47	Graduate	Epidemiology	4	1
Iris	F	22	Graduate	English	3.5	3
Jade	F	23	Graduate	Law	6	4

*Names used for participants are aliases.

Recruitment of participants involved three methods. First students of an undergraduate course in business communications were invited to participate. Next, an e-mail announcement of the study was circulated to a church group of university students. Finally, small posters describing the study and inviting participation were posted on the university campus. Six students from the business course, three from the church group and one, as a result of the posters, participated. To encourage involvement in the study, each participant received payment of five dollars.

The sites participants viewed were: Coca-Cola, Williams-Sonoma, Cingular Wireless, Raymond James, Procter and Gamble, and EAS. (See the following section for a discussion of these sites.) Only one participant had previously visited any of these sites. For all other participants, each encounter was a first. In terms of prior knowledge of the company, a good mix existed. All were very familiar with Coca-Cola. Most knew Procter and Gamble well. None had ever heard of Raymond James, and only one had prior knowledge of EAS. Of the five who viewed the Williams-Sonoma site, three had only a vague recognition of the name. Similarly, the five who viewed the Cingular Wireless pages had some knowledge of the company, but only vaguely.

Site selection

In choosing Web sites to study, the driving goal was to have a mix of sites that would represent a cross-section of design styles and corporations currently on the Web. The aim was not to assess the usability of any one Web site, but to identify common patterns of user behaviors

across varying home page designs. The following guidelines were established to ensure the sample was somewhat representative.

1. *Information elements.* Include sites with few, average and many information elements on the home page to capture a variety of design styles for comparison purposes.
2. *Name recognition.* Include organizations whose names and/or brands are highly recognizable, as well as those whose names and/or brands are not likely to be widely recognized. This permits comparison of orientation efforts where users have prior knowledge of the company with such efforts where users have no prior knowledge of the company.
3. *Content.* Include sites with content that is likely to be of interest to or aimed at users similar to study participants. To this end, all companies who operate strictly on a business-to-business basis were excluded.

With these guidelines in mind, the lists of the Fortune 1000 (<http://www.fortune.com>) and the Inc. 500 (<http://www.inc.com>) were reviewed. After inspection of the home pages of over 100 of the companies, 40 were chosen for further review based on the preliminary belief that they would meet the guidelines listed above. These 40 home pages were then inspected in greater detail and measured on three factors: number of text items, number of graphics and number of link options. Text items were defined as any body of text consisting of two or more consecutive lines of text, which may include embedded links but are not main navigation links (i.e., part of a list of links providing access to multiple sections of the site). A paragraph was counted as one instance of a text item. In addition, a single line of text extending across at least 50% of the screen was counted as one instance of text. Graphical items included all pictures, icons and images (i.e., jpegs and gifs) regardless of whether these were hyperlinked and/or animated. A cohesive set of graphics was counted as one instance. For example several sites used numerous small graphics for the options on a navigation bar. Since these graphics seemed to fit together to

form one complete picture, they were counted as one instance of a graphical information item.

Finally, any hyper-linked item, textual or graphical, was counted as a link option.

The mean and median for each of these factors were taken (see the last rows of Table 2), and the sites were divided into three categories: those ranking well above average in two or more categories, those ranking well below average in two or more categories, and those ranking around the average in two or more categories. This provided a variety of interface design styles from which to choose the final sites. For the above and below average sites, the goal was to choose sites closer to the extremes (in terms of number of information elements) to allow for a wide variety of styles. The final choices were aimed at achieving the mix prescribed in the three guidelines above. Table 2 provides a comparison of the six sites in terms of numbers of information elements.

Table 2

A comparison of the six Web sites in terms of number of information elements

Company	Text items	Graphical items	Link options
Coca-Cola	0	6	10
Williams-Sonoma	0	3	16
Raymond James	4	6	42
Cingular Wireless	8	14	21
EAS	22	17	91
Proctor and Gamble	11	12	142
Median*	6	8	34
Mean*	7	10	60

*These statistics refer to all 40 sites examined.

Below, the selected sites are discussed in terms of how they fulfilled the guidelines outlined above. Screen shots of the six sites appear in Appendix A.

Information elements. Proctor and Gamble and EAS represented the category of many information elements, ranking well above the median on all three factors. Raymond James and Cingular Wireless were roughly average. Coca-Cola and Williams-Sonoma had few information elements.

Name recognition. Coca-Cola and Proctor and Gamble provided highly recognizable company and brand names. The remaining four companies would provide brands that would be somewhat recognizable to some participants and completely new to others. Cingular Wireless was a fairly new company at the time of the study, but was conducting a significant advertising

campaign concurrently. It would not be likely that participants with little interest in exercise would recognize EAS, a manufacturer and seller of fitness supplements. Williams-Sonoma would be partially known by their brick and mortar stores, while Raymond James was expected to be the least well known. Together, the six sites provided a good mix of the familiar and unfamiliar.

Content. Coca-Cola and Procter and Gamble both manufacture products aimed at target markets that would include all of the participants in the present study. The remaining four companies manufacture and/or market products and services that would be of interest to most of the participants.

It should be noted that during the course of the study, four of the six companies modified their home pages. Therefore, all participants viewing a given company's home page did not necessarily see the same version. Screen shots of all versions are contained in Appendix A, with notes regarding which participants viewed each version. The Williams-Sonoma site was altered twice during the course of the study, producing three different versions. The main graphic was changed twice and the last of the main link options was changed once. The graphics in the three versions were significantly different, but otherwise the three versions were relatively the same. Cingular Wireless altered its home page once by reducing the size of some graphics and replacing other graphics. A feature of scrolling quotes was removed from the bottom of the page, as well. Raymond James made one revision to its home page by removing three links from the left column, adding three links to the right side of the page and moving the "Spotlight" feature from the bottom to the right side of the page, thus shortening the length of the page. Finally Procter and Gamble also changed its home page once. The categories on the top navigation bar were renamed and some were consolidated. The features in the main body of the page were doubled in number. The HTML pull down menus on the left side of the page were, for the most part, replaced with textual links in colored boxes. Additional links were added to the right side of the page, as well. Overall these changes resulted in an increase the length of the page. Coca-Cola and EAS made no changes to their home pages during the course of the study.

Interview Structure

Semi-structured interviews were chosen to provide an effective method for gathering rich qualitative data while allowing for some comparisons across participants. Interviews offer the researcher the opportunity to elicit more detail from participants and to explore a participant's reactions in depth when necessary. At the same time, since all participants viewing a given site are asked the same set of questions, and since the questions for each site are nearly identical, the researcher is able to make some comparisons across interviews and find common patterns.

All interviews were conducted in the Interaction Design Lab of the School of Information and Library Science at the University of North Carolina at Chapel Hill. The 30 minute, one-on-one interview sessions were captured on videotape for subsequent analysis. Each participant viewed three of the six sites. To avoid order effect, the sites were assigned so that no two participants viewed the same three sites in the identical order.

Questions. The complete set of questions is contained in Appendix B. In general participants answered four types of questions: orientation, tasks, perceptions, and attitudes toward and knowledge of the sponsoring organization. Orientation questions (i.e., "Where are you?" "What can you find here?") were designed to measure the basic functions of a home page. Another type of question focused on tasks. Participants were given five tasks, one at a time, and asked whether or not they felt the site would provide the answer. If so, they were asked where they would begin searching for the answer. They were not required to find the answer, however. The purpose of these questions was to provide a means of comparing other factors with beginning a search. In addition, these tasks would offer insight into home page link options. Perception questions focused on aesthetic appeal and perceived usability. The final set of questions elicited participants' prior knowledge of the site and sponsoring organization and attempted to identify any influence the home page had on the participant's knowledge and attitude toward the organization and site.

The same questions were asked for each site, with the exception of task questions. Of the five tasks users were asked to contemplate, three were the same for all sites. These dealt with finding employment information, the company's annual report and contacting the

organization. The remaining two questions were unique to each site and focused on specific content. These questions, designed to be moderately difficult, focused on separate areas of the site. Thus, to answer them, participants would have to consider different link options.

Analysis

Once all the interviews were completed, they were transcribed. These transcriptions included notations not only of what participants said, but also of what they did as they answered the various questions. Each response to each question was analyzed on two levels: 1) to identify what information elements participants used to answer a given question and 2) to identify their reactions and opinions of those elements. For the most part, the first analysis was straightforward as the video clearly identified the information elements with which users were interacting. Their comments offered clarification in situations where any uncertainties existed. The second analysis was accomplished by content analysis, using participants' words and phrases to characterize their reactions to the information elements and to identify the aspects of those elements to which they were reacting.

From these two levels of analysis, common patterns became evident regarding the information elements participants used to answer certain types of questions. In addition, major themes regarding types of information elements also began to emerge suggesting what roles these elements play in the process of orientation. Quotes from the transcripts were assembled in files depending on the information element to which they were referring. These quotes were then arranged further into themes based on the manner in which the participant used the element or his or her reaction to the amount or some other quality of the information element. These themes are discussed in the *Results* section.

It should be noted that the purpose of this study was not to judge the usability of the six sites, nor to compare them one with another. Rather, the intention was to look for common patterns in the way people interact with information elements on the home page across sites of varying design styles. As such, effort was made to focus only on the aspects of participants' comments and actions that were not site specific. In addition, because the home page was the

focus of this study, special attention was given to themes that focused on issues specific to home pages and the orientation process.

Some of the data are reported below in terms of site views. One site view is defined as one participant viewing one Web site. Thus, with 10 participants viewing three sites apiece, there were a total of 30 site views. To provide a fuller picture of the commonality of a result, the actual number of participants responding in a given way and the number of sites where that type of response was observed may also be noted.

Results and Discussion

There appear to be some common patterns in the ways people use home pages, and these patterns may hold implications for designers. Presented here are the results of the study and a discussion of several interesting and informative themes that emerged from the analysis of the data. This section is divided into two parts. The first reports on some general design issues such as the role of the home page from the user's perspective and factors affecting perceived usability and aesthetic judgments. The second part explores each information element type in turn, examining when participants used those elements and how they responded to varying amounts and qualities of them.

General Home Page Design Issues

Visitors arriving at the home page of an organization's Web site want to identify where they are and find an introduction to the organization and its site. In addition, they appear to form initial impressions of site usability and attractiveness which change very little after prolonged exposure to the home page. This section discusses how participants interacted with the home pages to form these impressions and expectations, make judgments and begin tasks.

Home page design for orientation

As noted earlier Web design experts advise that home pages should clearly indicate the purpose of the site and sponsoring organization. This advice would be well taken given the results produced by this study. One theme that clearly emerged is that users do form ideas about

a company from its home page and want a home page to tell them what the sponsoring organization does. Five different participants, speaking of several different sites (EAS, Cingular Wireless, Williams-Sonoma, and Raymond James) felt a better explanation of what the sponsoring organization did would help the site and their understanding of the company's mission. Three of these sites did offer some such explanation (Williams-Sonoma, Raymond James and EAS) but some participants still felt uncertain about site purpose. This issue is discussed in greater depth in section below entitled *Text*. For our purposes here, it is important to note that people do expect a home page to provide an introduction of some type, not only to the site, but also to the sponsoring organization.

Identifying location. Not surprisingly, a graphical logo of the company name was the element participants used most commonly to identify where they were. In 29 out of 30 site views participants pointed to such an element as providing them the information to answer the question "Where are you?". For additional location information, participants also looked at the site URL (3/30 site views, 3 participants), main navigation link titles (3/30 site views, 3 participants) and the Web browser title bar (2/30 site views, 2 participants).

Identifying content. In trying to gain an understanding of the breadth and depth of site content users turned most frequently to navigation elements all over the page. In all 30 site views participants used links to explain what they thought they could do and find on the six different Web sites. With very few exceptions these were textual links. Some, of course, were text rendered through a graphic rather than HTML, but all in all, participants read words to identify content. At EAS, Raymond James, Cingular Wireless and Williams-Sonoma, six participants, representing 13 out of 30 site views, read portions of textual paragraphs (or, in the case of Williams-Sonoma, the tagline "A place for cooks") to identify content. Five participants (in 10 out of 30 site views) used graphics to make guesses about site content at Coca-Cola, Cingular Wireless and EAS. However, these guesses were less accurate, and participants were more likely to admit they were not certain if their reasoning was correct.

The effect of number of information elements on overall impressions. First impressions were noticeably more positive on the sites with fewer information elements (Coca-Cola and

Williams-Sonoma) than on those with many (EAS and Procter and Gamble). Positive comments used to describe the former included “fun”, “cool”, “elegant” and “attractive” among others. The negative words used to describe first impressions of the latter included “busy”, “hard”, “boring”, “cluttered” and “cheap”. Of the two sites with an average number of information elements, Cingular Wireless was received more positively (although not to the same extent as were Coca-Cola and Williams-Sonoma); Raymond James received very neutral reactions.

After interacting with a given home page for nearly 10 minutes, participants’ overall impressions of that page tended to remain consistent with their first impressions. There were no cases of any dramatic shift in impressions, such as from a negative first impression to a positive last impression. The words that participants used initially to describe a page, they tended to continue to use throughout the entire site view. The importance of creating a positive first impression on the home page is clearly indicated by these findings. A simple, uncluttered design may help to achieve that positive first impression.

Simplicity versus busyness

The data show that participants prefer simple home pages to busy ones; uncluttered ones to cluttered ones. But it is more than a matter of preference. Busy pages—those with more information elements—would appear to increase the cognitive load of users to the point that they can become confused or uncertain of how to proceed. The pages with few information elements (Coca-Cola and Williams-Sonoma) were regularly referred to as “simple”, while the pages with the most information elements (EAS and Procter and Gamble) were most frequently referred to as “busy” or “cluttered”. Some participants called the two remaining sites (Cingular Wireless and Raymond James) “simple”, but others referred to these as “busy”.

Users react favorably to simple Web pages and unfavorably to busy ones. The two sites with the fewest information elements (Coca-Cola and Williams-Sonoma) were consistently praised for their simplicity. Several users mentioned this quality as the thing they liked the most about those pages. On the other hand, several participants felt those pages with the most information elements (EAS and Procter and Gamble) were too busy and cluttered, and that this quality hindered the usability and aesthetics of those pages. In speaking of the busyness of these

two home pages, participants used such words as “intimidating”, “hard”, “complexity”, “overwhelmed” and “time consuming”. When discussing the relative busyness of a page, users did not point to any one type of information element more than others. It would appear that the simplicity or busyness of a page is determined by the totality of the various information elements that comprise it.

Users feel confused or uncertain on busy home pages. While examining the EAS and Proctor and Gamble home pages, several participants expressed frustration with the busyness of the pages and blamed this busyness for keeping them from knowing what the purpose of the site was and how to proceed to desired content. The initial reaction that Jade experienced when viewing the EAS site was somewhat typical: “Busy. And I have no idea where I am or what this is. It's a sales site. Looks cheap. I don't like it. It's too busy. It looks like a cheap sales site. The red and blue colors, all the little sections of the page—not good.” Fred's response was similar: “It looks a little cluttered. You don't know where it wants you to go.” Busy home pages can create negative first impressions, starting users off on the wrong foot and impeding their progress.

Perceived usability

Participants tended to be very merciful in judging the usability of a Web site, with few offering any substantial criticisms. This may be due to fairly low expectations of usability. While using the pages participants did encounter difficulties, which surely would have affected any measurement of actual usability, even if those difficulties did little to alter perceived usability. Of great interest was insight the data provided into how users judge site usability. In 25 out of 30 site views, participants used navigation links to show why they felt a given site was usable or not. In particular, participants measured the clarity of navigation labels, the organization of links and the speed with which they felt they could access information. In addition participants credited navigation links that light up when moused over as making a page more usable in four site views. These findings are in keeping with our general understanding of the purpose of a home page as the entrance to the site and its contents; a means to the end, but not the end in itself. As such, users want a home page to provide them clear paths to content. Since for the most part, users are only “passing by” when they are on a home page, navigating becomes a primary task. Thus,

the relative usability of a home page in the eyes of the user can be measured by its navigation system.

In addition to navigation, two other factors seem to influence perceived usability. Five participants, during five different site views, pointed to the simplicity or busyness of the page to describe why that page was either easy to use (if simple in design) or not (if busy in design). Finally the amount of text on the page seems to influence perceptions of home page usability for some. Two participants, speaking of separate sites (Coca-Cola and Procter and Gamble), said the presence of a lot of text on a home page, made them want to avoid it.

Judgments of aesthetics

While one might think graphics, more than anything else, would influence users' judgments of Web page aesthetics, a number of factors appeared to have an impact with color being the most dominant. All but one participant (out of a total of 15 site views) pointed to color combinations as the main factor affecting their judgments of the attractiveness of a home page. This included colors rendered in fonts and background areas by HTML or those included in graphics. The subject of color surfaced over and over in interview after interview while discussing other topics such as first impressions and what participants liked the most and least about a page. In general, there does not appear to be any consensus regarding "good" or "bad" colors. The six sites contained a wide variety of colors including greens, blues, purples, reds, browns, yellows and oranges. The vast majority of comments made regarding colors were positive in nature. The co-ordination of colors seemed to be what participants were responding to most frequently. They liked the contrast of the white and red at Coca-Cola, the mixing of the blues and browns at Raymond James and the way the pale yellow band across the top of the Williams-Sonoma page matched the colors in the image. The negative comments participants made about colors occurred almost exclusively at EAS, by far the most colorful. On average, excluding colors in images, the other five pages had essentially two main colors prominently featured—though these colors may have appeared in multiple shades. The EAS page, on the other hand, had three or four colors, depending on whether the purple and blue were counted together or separately. In addition, EAS displayed links in three different colors and text in at least four colors other than

black. Two participants reacted negatively to the use of red text, which, Jade said, “looks cheap—like cheap sales,” and Geena said, “looks like spam”². Geena also commented that it seemed as though, “they just picked colors randomly” and, “it’s the purple [top navigation bar] and the yellow [‘Shortcuts’ menu] and the red [text in body of the page] that kind of jar together, and I think that makes it look less coherent.” It would appear that user judgments of aesthetics are more affected by how well colors on the page blend together, than they are by the individual colors themselves. While the use of color on the page is certainly advised, designers would do well to limit the number of colors used to two, possibly employing varying shades of these for variety.

Once again the simplicity or busyness of a page’s design influenced user judgments. In 11 site views, participants felt simplicity was attractive and busyness was not. Seven participants, in nine different site views, listed graphics among those elements that affected their opinion of page aesthetics. The mere presence of graphics on the page did not guarantee positive aesthetic judgments, nor did large numbers of graphics. Williams-Sonoma received considerable praise for its single graphic. In fact, the many graphics used on EAS were not favorably received by most participants. In the words of Jade: “They need a unifying graphic—too many little pieces all over the page.” Five participants mentioned a sense of organization (or lack thereof) as influencing their perception of a site’s attractiveness, while four participants felt that the presence of too much text hindered the aesthetics of a Web page.

In 16 site views perceived usability and aesthetic judgments were virtually the same, indicating a connection between these two variables as suggested in the literature. The remaining 14 cases were split roughly in half. In eight instances, including three site views of Procter and Gamble and four of EAS, usability was perceived to be better than aesthetics. While clutter adversely affected both perceived usability and aesthetic judgments, it may have had a greater effect on the latter. Finally, in six site views, participants judged aesthetics better than usability. These instances involved three from Coca-Cola which participants rated extremely high in terms of aesthetics, but criticized in terms of usability because of the small number of navigation links. While there does appear to be some relationship between these two subjective measures

² Spam: junk e-mail, usually an advertisement.

(perceived usability and aesthetic judgments), the data also make clear that people look to some different elements to evaluate sites on these two measures.

Tasks

As mentioned above, when participants were asked what sorts of information they could find on a site, they tended to use navigation links throughout the page. However, when it came to searching for a specific piece of information, participants turned to the main navigation bar or list more than any other link or set of links on the page. Here the use of the word “main” (navigation bar or list) refers to the collection of links with the greatest prominence (at Coca-Cola or Williams-Sonoma) or the one located across the top of the page (at Raymond James, EAS and Procter and Gamble). In the cases of Coca-Cola, Williams-Sonoma and Raymond James, participants had little choice but to begin tasks from the main navigation lists.

To better understand the significance of where participants chose to begin tasks, the activities on the three other sites were examined closely. For generic tasks, such as finding employment, contact and financial information, participants went immediately to the main navigation bars to begin searching, without even considering other links. Indeed, in almost every case this was the only way such information could be located. When the tasks were more site-specific, such as finding information on Procter and Gamble’s latest shampoo, or Cingular Wireless’ rate plan, participants were more likely to consider links in the main body of the page. It may be that users expect links in the main body of the page to pertain to special items or content central to an organization’s activities, but more “generic” categories of information to be accessible only through the main navigation. If so, this is likely as a result of cultural convention, and, as such, something to which designers should pay heed.

Cingular Wireless, Procter and Gamble, and EAS were the only sites that provided duplicate links in the main body of the page and on the top navigation bar from which participants could have accessed the needed information with equal efficiency. At Cingular Wireless and Procter and Gamble, participants began their tasks from links in the main body of the page in half of the cases where such duplicate links were available. At EAS, however, participants never began a task from a link in the main body of the page although they could have done so in 10

cases. The reluctance of participants to consider links in the main body of the EAS page is most likely attributable to negative feelings toward the clutter or busyness of that page. As mentioned above in the section on *Simplicity versus Busyness*, participants felt a strong aversion to using the pages they perceived as too busy or cluttered.

Overall users were quite successful with the first link they would choose to look for information to accomplish a specific task. Since participants were not asked to find the answer, but merely to indicate where they would begin their search, it is not possible to measure the overall success rate of these tasks. However, out of a total of 150 tasks (five tasks per participant per site), 126 started out successfully. The only major theme among the 24 unsuccessful tasks was an unclear conceptualization of site content. That is, participants perceived a site to have something it did not (an annual report at EAS, for example) or not to have something it did (games and downloadable music at Coca-Cola, for instance).

To improve site navigation from the home page, at least for the most common tasks, designers should give prominence to the main navigation bar or list and avoid cluttering the page with many features and links embedded in paragraphs of text. Clarifying the purpose of the site and sponsoring organization may also help visitors rightly assess site content and where to begin a search.

Exploration and expectations

One of the questions to which each participant responded at each site was why the home page of that site either did or did not prompt them to want to explore the site further. Overwhelmingly the responses involved one thing: content. If participants could not relate the content of the site to their own lives and interests, they rarely said they wanted to explore beyond the home page. However, when something about the content appeared to be in line with a current interest, they were eager to explore. The only exception, and this may not be a complete exception, is when some ambiguous link on the home page piqued the curiosity of a participant, and that participant desired to explore further just to find out where the link led. For more discussion on this, see the *Links* section below.

For the most part the home page clearly influenced the expectations participants held of what the rest of the site would be like. If participants felt positively about the home page, they expected to feel positively about the attached pages. If they disliked what they encountered on the home page, they were certain they would dislike the rest of the site. For example, participants described the home page of Raymond James as “professional” and “business-like”. They used similar terms to describe their expectations of internal pages. Those who routinely referred to Coca-Cola’s home page as “fun” and “cool” felt they would find “more fun stuff” within the site.

Findings Regarding Specific Information Elements

Participants used certain information elements for certain purposes and other elements for different purposes. For example, when assaying site content and usability, links were the indicators participants used most frequently. When formulating feelings about the site, participants were most heavily influenced by graphics. This section focuses on various information elements and the themes from the data regarding these elements. Links, text and graphics are discussed in turn, followed by discussions of sound and technologies, two additional elements to which users had some strong reactions.

Links

Link-related themes appeared more frequently in the data than any other kind of theme, suggesting that navigation may be the most important home page feature in the eyes of users. Participants judged usability based on links and indicated a clear preference for navigation systems that were organized and provided quick access to a wide variety of pages within the site without cluttering the page. They reacted positively to various methods of making links appear as links and had mixed reactions to links with ambiguous destinations. The numerous themes relating to navigation links on home pages are discussed in turn below.

Users judge site content and usability by the main navigation bar or list. More than any other information element, regardless of the site being examined, all participants pointed to navigation links when discussing their perceptions of site usability. Participants routinely cycled through main navigation lists when talking about their impressions of how easy a given site was

to use. Debbie, praising the usability of the Williams-Sonoma site, spoke of the various navigation options. “It seems like it would be easy because it’s pretty basic. Feel like you know they either have what you want or they don’t from just the categories [main navigation list]³.” The small number of navigation choices on the Coca-Cola home page caused some participants to doubt its ease of use as Aaron’s comment suggests: “Usable? It might have more topics underneath each of these categories [main navigation list] but it doesn’t look like you can easily find just any type of information. It might be harder to use than others [Procter and Gamble, and Raymond James] we’ve seen”. Navigation options need to appear to be complete from the user’s perspective—that is, containing all main categories he or she expects to find—if the site is to be judged easy to use.

Users perceive a very small number of links on the home page as difficult or confusing.

While this theme only surfaced at the Coca-Cola site, it reflects a belief held unanimously by those who viewed the site. All five participants remarked that the page needed more link options because, in the words of Aaron, “You’re going to have a hard time finding things.” This belief seems to have stemmed from the notion that Coca-Cola is a very large organization and would, therefore, have a great deal of information to provide on its Web site. The presence of only four main navigation links seemed to participants to be obscuring important information. As Geena put it, “I don’t know what else there is in the site, but my sense is there might be more things to do in the site than you see immediately. If there is, that needs to be announced.” While the overall data clearly indicates a preference for simple, uncluttered pages, less is not necessarily always better. Too few options at the top level leaves users wondering where to start looking for the information they are seeking.

Users prefer navigation options to be organized and in one place on the page.

Participants complained when they perceived sites to have link options scattered randomly around the page (e.g., EAS), but they praised sites that presented links in a single place with some sort of organization (e.g., Williams-Sonoma). Iris expressed her frustration with the Raymond James site saying she didn’t know where to click first because of the disorganization of the links.

³ In direct quotations square brackets [] are used around text added by the author to provide clarification.

I think it's got enough links. I definitely think it's got plenty of links. I think it's usable. Well it's kind of confusing, I guess I could say because there's links up here [top center navigation tabs] and links here [left side navigation list] and there's links in the middle of the page ["What's New" section] and there's links to the right of the page. I would almost want to take all the links and put them in one section of the page. I just think the design could be more streamlined. I think links could be either in one section of the page or another section. I just think there's a whole lot. There's links everywhere you look.

This desire for organized, consolidated navigation lists, is a further indication of how users perceive links to affect usability. If, as previously suggested, users want navigation more than anything else from a home page, then the more organized the navigation system, the more usable users will perceive the site to be.

Users like sub-menus that appear on demand and provide quick access to content across large sites. In trying to grasp the purpose of a sponsoring organization and the scope of its Web site's content, participants regularly examined main navigation lists and menus. When these included sub menus that appear on demand, such as when running one's mouse pointer over a navigation category label, users tended to react very positively. They liked have the added information provided by these sub menus and the ability to move directly to content of interest. Iris' comment about Procter and Gamble's use of such sub menus was typical.

I like the rollovers [on the top navigation menu]. That's really cool because when you roll over it, it gives you a sub menu. This is a neat way to organize your links. So people wonder "Which one do I click on" and then they roll over them and there are submenus. That's a really cool way to organize things. I like the top portion of the page the best.

Fred explained the benefit these sub menus provide in reducing the number of mouse clicks required to access information: "I like the top here that drops down choices here [top navigation bar with drop down menus] so you don't have to select 'About EAS' and that takes you to a new page where you have those five choices [sub menu choices]. So I think you can narrow down your search much quicker." Debbie criticized Williams-Sonoma for not providing such detailed navigation options, saying,

I would prefer to have more information of what they're offering: some pictures and different sections how the other one [Procter and Gamble] had. You just put your mouse on it [main navigation bar] and you get a list of what was in each category. So I didn't have to click on it. What's part of these categories?

In short, the use of more detailed sub menus that appear on demand, help users more clearly identify content and improve their perception of the usability of a site.

Pop-up menus can hinder usability and the user experience. For all the benefits that participants found in sub menus, they did experience some difficulties caused by the technologies enabling the dynamic menus. All five participants who examined the Raymond James site reacted negatively to a pop-up “Subsidiary Companies” sub menu that appeared when they were not expecting it, obscured content on the center of the page and would not disappear unless they deliberately closed it. Heidi referred to this menu as “intrusive” and cited it as the reason she couldn’t consider the page very attractive.

Participants experienced similar frustration with sub menus on EAS. While most praised the added information these menus provided, their frustration arose from the temperamental nature of the technology. The main navigation category labels, over which users must roll their mouse pointer to get the sub menus, are fairly small in size. Often, in moving the mouse pointer from the main navigation category label to the sub menu, the user would inadvertently mouse over another main navigation category label, thus changing the sub menu being displayed. Geena expressed the frustration this caused: “Here’s something else that’s hard to use about this site, is that you have to be very specific about where you put the mouse.” While these sub menus provide users with the details they want, care must be taken that the manner in which the technologies are implemented does not interfere with users’ tasks.

Users prefer links that clearly appear as links. Augmenting the evidence that navigation is of central concern to users of Web home pages are the accolades participants gave to methods of clearly separating hyperlinked elements from non-hyperlinked elements. The use of colored text, JavaScript rollovers and small lines between navigation list options helped users identify links. Fred, pointing to Coca-Cola’s use of JavaScript rollovers, articulated what many liked on several sites. “You know which picture you’re clicking on because it highlights, so that makes it easy. These things [main navigation options] light up.”

However, in some cases, participants complained because they could not tell what was and was not a link. Two different participants were surprised to discover that the long list of brown textual labels down the left side of the Raymond James home page were links. It is possible that the use of more standard link colors would have helped. While looking at the Cingular Wireless

page, Eric commented, “It seems pretty easy, but there’s a lot of stuff all over it, and so everything looks like it could be a link. So that looks like it might detain you a little bit. In this case it’s semi-confusing.” Obviously efforts to clearly distinguish hyperlinked elements from non-hyperlinked ones can improve perceived and, possibly, actual usability. However such efforts could be thwarted if designers move too far from standard conventions or clutter up the page with many attention-grabbing elements.

Ambiguous links (textual and graphical) confuse users and make them uncertain where to begin looking for information. Much in the literature warns against ambiguity of links, encouraging designers to devise links that provide good information scent and offer users a clear indication of distal content. There were a number of instances in the interviews where users expressed confusion over the destination of a given link, and, as a result, had some measure of difficulty deciding where to begin looking for information. For example, more than one participant noted the ambiguity of a Procter and Gamble link entitled “Feedback Session”. As Beth put it, “I’m not sure what the ‘feedback session’ is, if you’re just talking on line with somebody. If that was the case, like I would be in a chat room or something, I would probably just do the ‘E-mail us’.” Several participants were confused about or misinterpreted a link that appeared on the Coca-Cola site in the form of a small question mark in the upper right corner of the page. This link provided instructions on how to use the animation on the home page, but participants thought it might be a way to get contact information or read answers to frequently asked questions. Clearly such ambiguity results in users having to try multiple paths before they finally find the information they are seeking. The danger is that they may become frustrated or angry and desert the site. However, the data also provided evidence that ambiguity of links is not altogether bad.

Ambiguous links are not necessarily bad—when they appear fun, they may make users want to explore. All visitors to the Coca-Cola site expressed a desire to click on the hyperlinked photos that were part of the scrolling Flash presentation at the bottom of the page, even though none of them felt very certain of what they might find. Curiosity and a spirit of “fun” inspired them to want to explore. Geena expressed it like this:

I want to click on the film because I want to know what that is. Like here, maybe on Lance Armstrong. Well, it could be a larger image [that I would find]. This [graphic of polar bears

among scrolling graphics] looks like one of the commercials they used to have, so it could be streaming video. Other than that, I don't know. These things pique your curiosity. You can see the mouse makes things happen with them, but you don't really know what all's behind there.

In addition to Coca-Cola there was evidence of this same phenomenon at other sites where participants wanted to click on a photo of Christie Brinkley and Cindy Crawford (EAS), a textual link entitled "Search and Catalog Quick Shop" (Williams-Sonoma), and a corporate icon (Cingular Wireless) simply out of curiosity. So, ambiguity can work in the favor of a site, if an atmosphere of fun has been established. However, it seems reasonable to hypothesize that a large number of ambiguous links will ultimately tax the user's patience.

Multiple links to the same information can cause confusion. At EAS, two different users perceived that similar information was accessible through more than one link on the home page. For the most part, they equated this with a usability problem, not knowing if, indeed, the two links would take them to the same place, or whether those links would lead to different pages with slightly different content. And, in the words of Eric, "I don't know if I'll find out more here [graphical link in main body] or up here [top navigation bar option], and I don't want to take the time to do both." It should be noted that the Procter and Gamble home page also provided multiple links to the same information, but no participant complained of this. In only one interview did a participant mention the existence of multiple links to one page of information, but when asked if she perceived this as a problem, she said no.

Text

The results from the study firmly support the guideline to use text sparingly, especially on the home page. Participants made clear their disdain for designs that forced them to read very much in order to understand the site and organization. What participants perceived as an excessive amount of text negatively affected their judgments of usability and aesthetics and ranked among the things they liked least about certain sites. However, there did not appear to be any clear consensus as to what constituted an "excessive" amount. Nonetheless, when they encountered blocks of text containing more than about 10 words, participants did not read them.

Three common themes emerged from the interviews with regard to the use of text on a home page.

Users don't want to have to read on the home page—and they won't. Users do not perceive reading as something they should have to do on a home page, other than to read a few labels or succinct explanations. Several participants spoke of sites as having “too much text for a home page”, obviously suggesting that a home page serves a different function than internal pages where greater amounts of text might be acceptable. Proctor and Gamble and EAS were criticized most frequently for having “too much to read”, though Cingular Wireless and Raymond James were also faulted for this, but not as frequently. A count of all words appearing above the scroll,⁴ using the same monitor and resolution, revealed Cingular Wireless with 175 words, Raymond James with 176, EAS with 214 and Procter and Gamble with 350. These four sites were, indeed, more “wordy” compared to Coca-Cola with 24 words and Williams-Sonoma with 66. Given these numbers, a guideline for the maximum number of words above the scroll might be somewhere just below 175, at which point participants in this study showed mixed reactions.

The very sight of large amounts of text made some participants reluctant to use the page. Celine, speaking of a previous experience with Proctor and Gamble, said that in order to “avoid having to read through all this [the main body of the page], I simply went” to the search function. Beth pointed to the paragraphs and features on the main body of the Procter and Gamble page and said, “All the writing. It's too much. Like if I'm just going to look something up on a Web page, on the home page I wouldn't want to see all this stuff. I would rather have that on a separate page.”

A further note of interest is that participants, regardless of what site they were viewing, did not read more than a few words from blocks or paragraphs of text containing more than 10 words, even though they spent, on average, 10 minutes looking at any given page. As Fred put it, while looking at Cingular Wireless, “I haven't, at this point, read everything—all this text [in main body of page] yet. And I have had the time to read.” It is likely that in their own environments,

⁴ Above the scroll refers to what is visible on the screen without scrolling.

using Web sites for their own purposes, users would spend less time on a home page, further reducing the likelihood that they would read text.

Users perceive home pages that use text sparingly as providing easy navigation.

Participants viewing the Cingular Wireless and Williams-Sonoma sites tended to credit the simplicity of the designs of those sites, particularly with regards to the small amounts of text used, with making it easier to choose navigation options. Referring to the main navigation list on the Williams-Sonoma site, Heidi said, “And I like the simplicity of all of the text here. I feel like you can get to what you would want to get to from this page, with as little text as is necessary.” When Beth viewed the Cingular Wireless site, she said the thing that she liked the most about the page was the white space. “It’s not so overwhelming. There’s enough white space and the words are limited so you can see what you want to go for pretty quickly.” Participants often used words like “busy” and “cluttered” when talking of sites that included more text (i.e., Procter and Gamble and EAS) and perceived this clutter to be obscuring their navigation choices.

Users want a noticeable but brief textual explanation of the purpose of the site and sponsoring organization. EAS, Cingular Wireless and Williams-Sonoma were all criticized for not clearly defining their purpose. Even after interacting with these home pages for 10 or more minutes, several participants still could not confidently or accurately say what it was the organizations were selling. Some participants felt that a brief textual paragraph of explanation might help, particularly in the cases of Williams-Sonoma and Cingular Wireless. Of Cingular Wireless, Fred remarked, “I still think they’re a little bit vague on what they’re selling. Maybe a little statement down here [bottom of page], or something.” Jade felt the tagline used by Williams-Sonoma was insufficient: “They should have a little paragraph telling more about the store—what it is. Well, there, it is a ‘place for cooks’, but actually I’m still not sure if they sell food or things for the kitchen, or what.”

In the case of EAS, which has a brief paragraph explaining the purpose of the company, more than one user commented that the paragraph needed to be made more noticeable.

Geena’s reaction was typical:

Geena: It has the right amount [of text]. It might need to be spaced out better. Like at the top of the page. This [2 line paragraph under top navigation bar] is all fairly small

font. And it's all in the space of these lines. So it's hard to read. And there's not much space between the bottom row [of the top navigation bar] and this little explanation of what the company does [2 line paragraph under top navigation bar].

Researcher: Have you read that?

Geena: No.

Researcher: How do you know what it is?

Geena: Context and a couple of words that I see.

Once again, participants felt that full, cluttered pages prevented them from seeing the most important items on the page.

Graphics

Graphics, more than any other type of home page information element, set the mood of the site. They appear to play an important role in the development of user feelings and attitudes toward the site and, perhaps, even toward the sponsoring organization. No doubt this is important in building brand image and drawing users into the site. Participants also used graphics to help them come to an understanding of site content and to navigate. Below, several themes from the interviews are discussed.

Graphics clearly affect users' feelings and attitudes. When asked to describe what they liked most (or least) about a given home page, on several occasions users mentioned a graphic. Williams-Sonoma, with its one large graphic, received the most comments, all of which were positive, with only one exception. A typical reaction was Celine's: "My first impression is that it's an attractive page because you have, like, your dishes and glass over here in the graphic. That stands out a lot to me." At Cingular Wireless, Fred credited the graphical company icon for producing positive feelings about the site: "I like it. It seems pretty friendly. Like, with this little guy here with the bubble coming up. They kind of tried to make it seem a little more human for a technology-type product. So, I think that's interesting." Others referred to graphics as making the page seem, "clean" (Raymond James), or "splashy", "lively" and "trendy" (Coca-Cola). Most of these comments were made during either first impressions or final summations, indicating that graphics do play an important part in shaping users' overall attitudes toward a site.

Users look to graphics for context in the orientation process—but with mixed results. Textual explanations and other labels are not the only elements on the page that participants used to identify the purpose of the site and sponsoring organization. In a number of cases,

participants mentioned how graphics shaped their understanding, sometimes correctly, sometimes not. One participant looking at the Raymond James page remarked that the picture of buildings played a part in her realization that the company dealt in things financial. While viewing the Williams-Sonoma home page, Celine said, “It’s attractive. When I first open it up, I see the dishes, the food, which ultimately tells me this is what this company does.” So graphics can be useful in enabling users to quickly identify site purpose and content.

However, there were cases where users misinterpreted the business of the sponsoring organization based on what they saw in a graphic. The photo of rubber ducks on one version of the Williams-Sonoma home page led one participant to think the company was involved in home decoration, not cookware. Clearly, care must be taken as to the content of graphics used on the home page since these visual information elements can easily influence users’ first impressions of site purpose. If these first impressions are incorrect, users may quickly abandon a site that could have supplied them with the information they were seeking.

Users prefer graphics that relate to link destinations and site content. When asked to comment on the use of graphics on the Cingular Wireless and Procter and Gamble home pages, three different participants remarked how the small graphics next to various link options either did or did not relate to the destination of the link as based on their interpretation of the accompanying textual link. At Procter and Gamble, Iris explained why the use of graphics on the page was good: “It has graphics that relate to the link.” She felt that this better prepared her to make navigation choices. As further evidence that users feel graphic content should match link destination content, consider Celine’s reaction to the use of graphics on the Cingular Wireless page.

They probably have enough graphics and pictures on here, but I don’t think they’re used well. I don’t really like the pictures or the graphics they chose. Like, this right here [left, graphic next to text: “Coast-to-Coast coverage with national rates.”]. I guess it’s a picture of the coast, but it’s not clear. This [left, graphic next to text: “The largest array of wireless data products.”], the eyes, the face, I don’t think it really applies here.

Users prefer sparing use of graphics for a simple effect. As with text, participants responded positively to a moderate amount of graphics on a home page. Again, they used the words like “simple and “simplicity” in a positive manner to refer to these pages (i.e., Williams-Sonoma and Cingular Wireless). Some felt that adding additional graphics to such pages as

Williams-Sonoma would “just make it look cheap and too busy,” as Jade put it. EAS, on the other hand, elicited negative reactions from participants because of its use of too many graphics. When asked his opinion concerning the amount of graphics on that page, Eric responded emphatically, “Way too much as it is. They probably need to simplify the site.” Graphics, like any other kind of information element, can overwhelm or overload the user if supplied in large amounts at any one time.

Sound

Overall, participants did not react favorably to the notion of adding sound to Web sites. Of the six sites studied, only the Coca-Cola site included sound. And it included quite a bit. Users responded favorably to this use of sound, however. Three themes centering on the use of sound emerged from the data.

In general, users consider the use of sound on Web sites to be annoying, inappropriate and of poor quality. Overwhelmingly, when asked if they thought a site needed sound, users responded in the negative. The adjective most commonly used to describe on-line sound was “annoying”. More than one participant mentioned that when using the Internet they often would have some form of sound or music in their own environment, with which any sound from a Web site would only clash. Participants also felt that sound was inappropriate for the images or lines of business of some of the sites’ sponsoring organizations. As Iris explained of Procter and Gamble, “It’s just a corporate site, and I don’t think that corporate sites need sound, unless they are a graphic design company or a video game company or have a product that deals with sound. I think sound can get really annoying.” Furthermore, participants felt that the general quality of Internet sound was poor and delayed download times excessively. Given these strong, unanimous reactions, there can be little justification for sound, currently, on most corporate Web sites.

Some users are receptive of sound used for fun. Having identified sound as something not appropriate for most organizational Web sites, the data also highlights some positive reactions to sound as it was used on the Coca-Cola site. There, participants laughed as they discovered they could make all sorts of Coke bottle related sounds just by running the mouse

pointer over objects on the screen. Again, the “spirit of fun” seemed to make Coca-Cola’s use of sound acceptable to participants. Aaron expressed what others also felt, “I like the sound. It’s cool. Helps the fun.” And Beth said, “Oh, this is much cooler than I thought it was. The sounds add to my interest.” However, one participant found even Coca-Cola’s use of sound to be annoying.

Technologies

The technologies used on the home pages had some effects on users’ experiences with those pages. In particular, issues related to download times and pop-up windows proved problematic.

Download times required for some technologies is a concern of users. Two users felt the Flash presentation on the Coca-Cola home page would significantly delay download times if they were to access the page from their own homes. Others expressed concern that additional graphics on any of the pages or the addition of sound, would also delay download times.

Users may perceive pop-up windows as annoying or intrusive. When first opened in the browser, the EAS site appears with a small pop-up window displaying an advertisement for an EAS product. Two participants mentioned that their initial reaction is to close such windows immediately. A third participant simply clicked on the main browser window, sending the pop-up window to the background, out of site. Referring to this type of pop-up menu, Eric said, “I hate, hate these little links [pop up advertisement window]. I go to ESPN.com everyday and it has this stupid daily challenge that pops up. I hate that so much.” Finally the pop-up navigation sub menu for “Subsidiary Companies” on the Raymond James home page elicited such adjectives as “intrusive” for the manner in which it popped up suddenly and obscured other objects on the page.

Summary and Conclusion

This research study used semi-structured interviews with 10 university students to gather qualitative data about their reactions to and interactions with the home pages of six company Web sites. The fact that the participant sample represented a fairly specific, homogeneous group

may limit the extent to which these findings can be generalized to other Web user populations. Nonetheless, the results do offer a framework for understanding how some people interact with home pages. Further studies utilizing other populations should test the robustness of the findings. The Web sites were selected to represent a variety of design styles based on the number of information elements included on the home page. Nevertheless, the particular sites selected and the fact that several of those sites were changed during the course of the study may bring the trustworthiness and generalizability of the results into question. However, it should be noted that the focus of this study was not the usability of particular home pages, but rather the common patterns of user behaviors across multiple and varying home page designs. Indeed, the findings do reveal that participants used similar behaviors in their efforts to orient themselves with each site, regardless of the design, sponsoring organization, or any other varying factor. The variations between and within sites only offered further evidence of these common patterns and themes. Thus, the implications from these findings are, in fact, generally applicable to other organizational Web sites.

Drawing from guidelines and research in the published literature, this study was formulated under the assumption that the primary purpose of the home page of a Web site is to introduce the visitor to both the site and the sponsoring organization. It was recognized that, in many cases, people visiting a Web site for the first time may also be encountering the sponsoring organization for the first time. Therefore, orienting the visitor to the content of the site and the purpose or mission of the sponsoring organization becomes critical. To understand how this process of orientation takes place, this study analyzed user interactions and reactions to information elements on the home pages of six different companies.

It is evident from the results that users view the home page as an entry point, but not one where they wish to spend significant amounts of time. Home pages should provide users a clear introduction to the sponsoring organization and the content of the site. The company logo, a brief explanation of company purpose and obvious navigation options providing quick, direct access to site content are some of the things users want most from home pages. They also want simplicity and hate cluttered, busy home pages. While on the home page, they judge site usability based on

the clarity and organization of navigation options and quickly formulate opinions—which they rarely change—about the site and sponsoring organization.

This study also sought to identify the major roles that three types of information elements play in the orientation process. Text, graphics and navigational links were examined in turn for the effects that varying quantities and qualities of each element have on a number of factors including first impressions, identifying site content, beginning to look for information, and judging site usability and attractiveness.

Users do not want to find large amounts of text on the home page, and if they do, they will not read it. Furthermore, users perceive navigation to be easier on sites that use text sparingly. They want graphics to “set the mood” for the site, be closely tied to the content they represent and not be used in excessive numbers. From these graphics, they formulate attitudes toward the site and sponsoring organization and, with mixed results, try to identify site content and purpose. Above all, visitors to home pages want and need excellent navigation systems. No other home page information elements are used as frequently or consistently by first time visitors trying to decipher site purpose, identify and search for content, and assess site usability. Time spent developing and testing the organization, labels and number of navigation options would be well spent in ensuring that positive first impressions—which also appear to be lasting impressions—are generated and the user-site interaction is a positive experience.

Overall, the results would suggest that designers should create simple, uncluttered home pages where broad categories of navigation options receive prominence, with more detailed lists readily available. These categories should be labeled to identify clearly not only site content, but also the company purpose. Certainly the company logo should be prominently displayed along with a brief textual explanation of the purpose of the site and organization. Features or special news items should be used sparingly, with text kept to a minimum. Because graphics and colors are very important to the development of image and positive attitudes, they should be carefully selected with consideration given to how they coordinate with each other and the content. Finally, considering the powerful impact that the home page has on user attitudes and perceptions of the site and sponsoring organization, designers and managers would do well to spend the time and

resources necessary to develop, test and refine these aspects their home pages for their target users.

References

- Amento, B., Terveen, L., Hill, W. (2000). Does authority mean quality? Predicting expert quality ratings of web documents. In *Proceedings of the 23rd annual international ACM SIGIR conference on research and development in information retrieval* (pp. 296-303). Athens, Greece: ACM Press.
- Bachiochi, D., Brestene, M., Chouinard, E., Conlan, N., Danchak, M., Furey, T., Neligon, C., & Way, D. (1997). Usability studies and designing navigational aids for the world wide web. In *Proceedings of the sixth international world wide web conference*
- Chi, E., Pirolli, P. & Pitkow, J. (2000). The scent of a site: A system for analyzing and predicting information scent, usage, and usability of a web site. In *Proceedings of the conference on human factors in computing systems, CHI '00* (pp. 161-168). The Hague, Amsterdam: ACM Press.
- Choate, T. (2000, August). 5 keys to customer conversion. *Catalog Age*, (supplement: i.merch@nt), S14-S15.
- Cooper, A. (1995). *About face: The essentials of user interface design*. Foster City, CA: IDG Books Worldwide.
- Does your company's web site click with job seekers? *Workforce* (2000, August), 26.
- Fitzgerald, W., & Goldstein, E. (1999). Honesty of Affordance. In J. P. Marsh, B Gorayska, & J. L. Mey (Eds.), *Humane interfaces: Questions of method and practice in cognitive technology* (pp. 179-189). Amsterdam: Elsevier.
- Fogarty, K. (2000, October 9). E-retailing still stinks. *Computerworld*, 34, 46.
- Haas, S., & Grams, E. (1998). A Link Taxonomy for Web Pages. In *ASIS '98 Proceedings of the 61st ASIS Annual Meeting* (pp. 243-252), Medford, NJ: Information Today, for ASIS.
- Jones, M. (1999). World wide web design. In J. M. Noyes & M. Cook (Eds.), *Interface Technology: The leading edge* (pp. 299-320). Baldock, Hertfordshire, England: Research Studies Press Ltd.

- Keevil, B. (1998). Measuring the usability index of your web site. In *Proceedings of the sixteenth annual international conference on computer documentation, SIGDOC '98* (pp. 271-277). Quebec City, Quebec, Canada: ACM Press.
- Krug, S. (2000) *Don't make me think: A common sense approach to web usability*. Indianapolis, IN: Que.
- Kurosu, M. & Kashimura, K. (1995). Apparent usability vs. inherent usability: Experimental analysis on the determinants of the apparent usability. In *Conference companion on Human factors in computing systems, CHI '95* (pp. 292-293). Denver, CO: ACM Press.
- Larson, K., & Czerwinski, M. (1998). Web page design: Implications of memory, structure and scent for information retrieval. In *Proceedings of the conference on human factors in computing systems, CHI '98* (pp. 25-32). Los Angeles, CA: ACM Press.
- Lee, A. (1999). Web usability: A review of the research. *SIGCHI Bulletin*, 31(1), 38-40.
- Mack, A. (2000, September 4). Sites by design. *Mediaweek*, 10(34), IQ36-IQ40.
- Maglio, P. & Campbell, C. (2000). Tradeoffs in displaying peripheral information. In *Proceedings of the conference on human factors in computing systems, CHI '00* (pp. 241-248). The Hague, Amsterdam: ACM Press.
- Neumann, L., & Ignacio, E. (1998). Trial and error as a learning strategy in system use. In *ASIS '98 Proceedings of the 61st ASIS Annual Meeting* (pp. 243-252), Medford, NJ: Information Today, for ASIS.
- Nielsen, J. (1993). *Usability engineering*. San Diego, CA: Academic Press.
- Nielsen, J. (2000a). Eyetracking study of web readers [10 paragraphs]. *Jakob Nielsen's Alertbox* [on-line column] May 14, 2000. Retrieved January 31, 2001, from the World Wide Web: <http://www.useit.com/alertbox/20000514.html>
- Nielsen, J. (2000b). *Designing web usability*. Indianapolis, IN: New Riders Publishing.
- Norman, D. (1988). *The psychology of everyday things*. New York: Basic Books.
- Norman, D. (1999). Affordance, conventions, and design. *Interactions*, 6(3), 38-43.

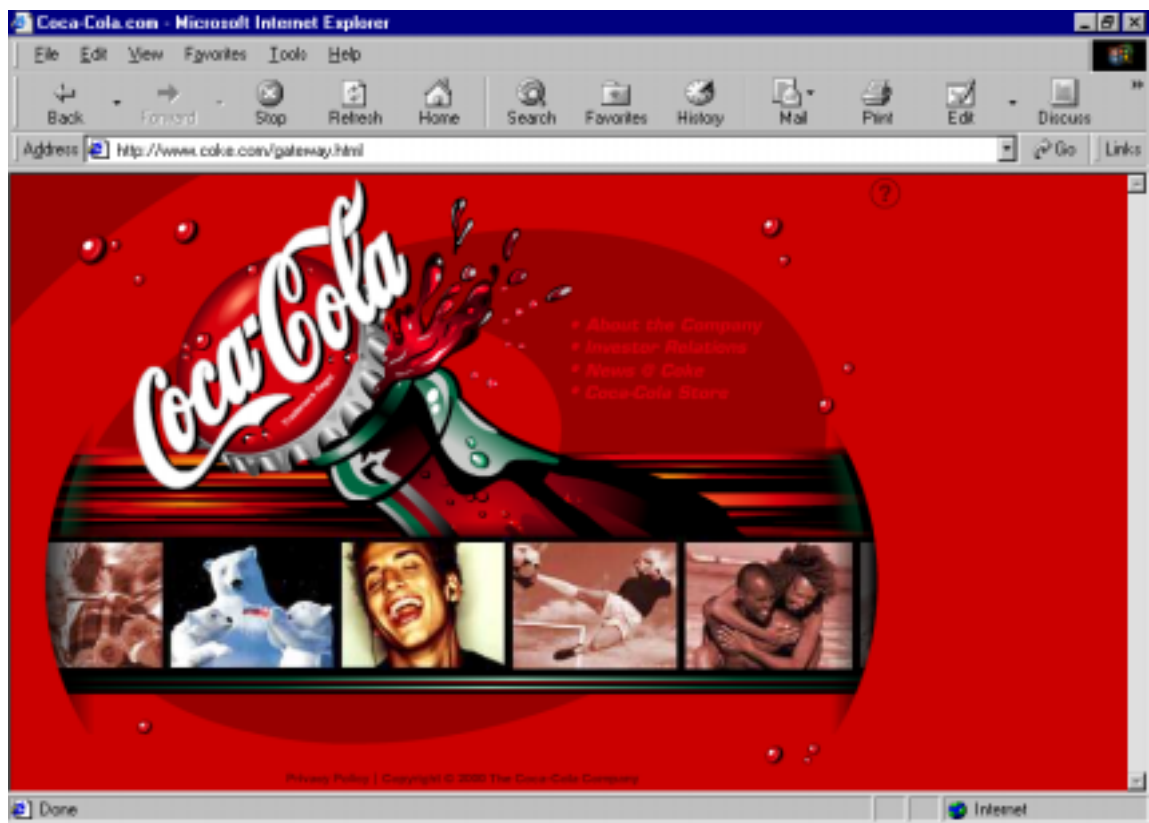
- Pirolli, P. & Card, S. (1995). Information foraging in information access environments. In *Proceedings of the conference on human factors in computing systems, CHI '95* (pp. 51-58). Denver, CO: ACM Press.
- Sears, A., Jacko, J., & Dubach, E. (2000). International aspects of world wide web usability and the role of high-end graphical enhancements. *International Journal of Human-Computer Interaction*, 12(2), 241-261.
- Singh, S., & Dalal, N. (1999). Web home pages as advertisements. *Communications of the ACM*, 42(8), 91-98.
- Spool, J., Scanlon, T., Schroeder, W., Snyder, C., & DeAngelo, T. (1999). *Web site usability: A designer's guide*. San Francisco, CA: Morgan Kaufmann Publishers, Inc.
- Thury, E. (1998). Analysis of student web browsing behavior: Implications for designing and evaluating web sites. In *Proceedings of the sixteenth annual international conference on Computer documentation, SIGDOC '98* (pp. 265 – 270). Quebec City, Canada: ACM Press.
- Tractinsky, N. (1997). Aesthetics and apparent usability: Empirically assessing cultural and methodological issues. In *Proceedings of the conference on human factors in computing systems, CHI '97* (pp. 115-122). Atlanta, GA: ACM Press.

Appendix A

Screen Shots

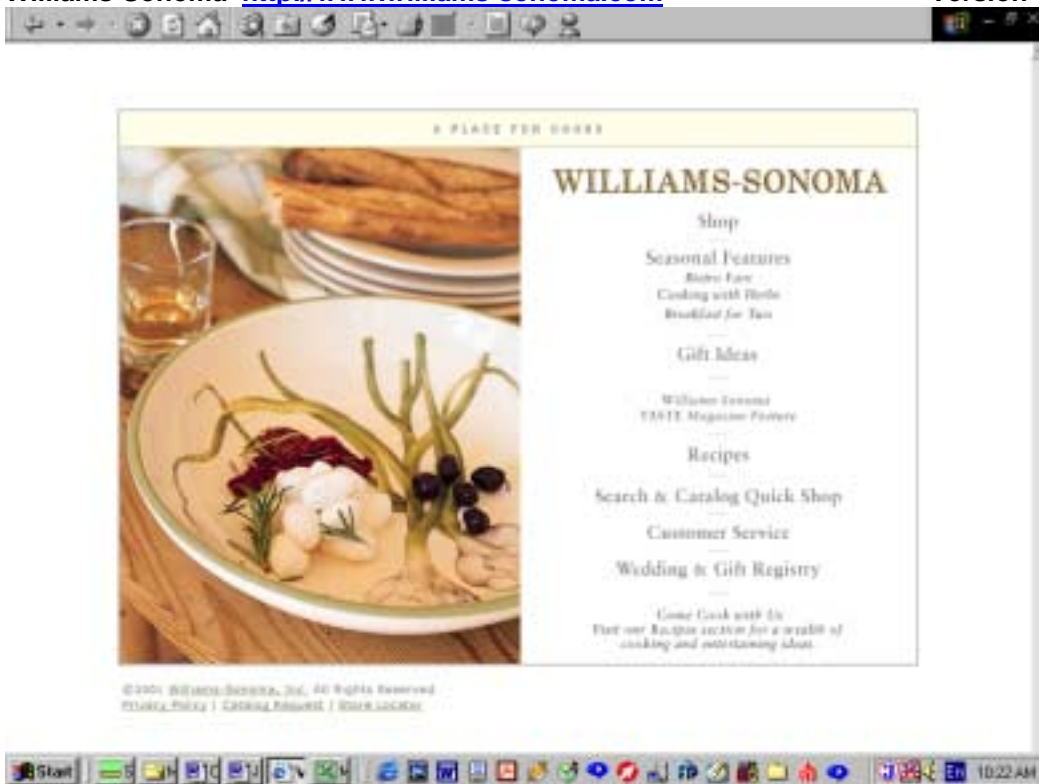
Coca-Cola

<http://www.coke.com>



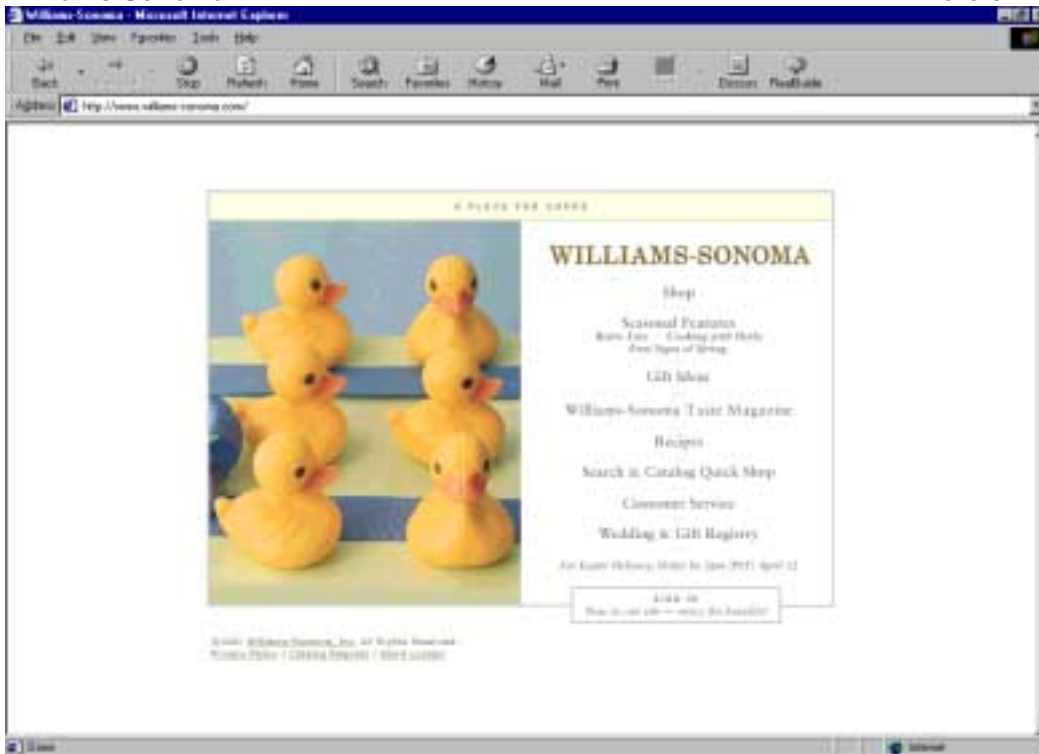
Williams-Sonoma <http://www.williams-sonoma.com>

Version 1



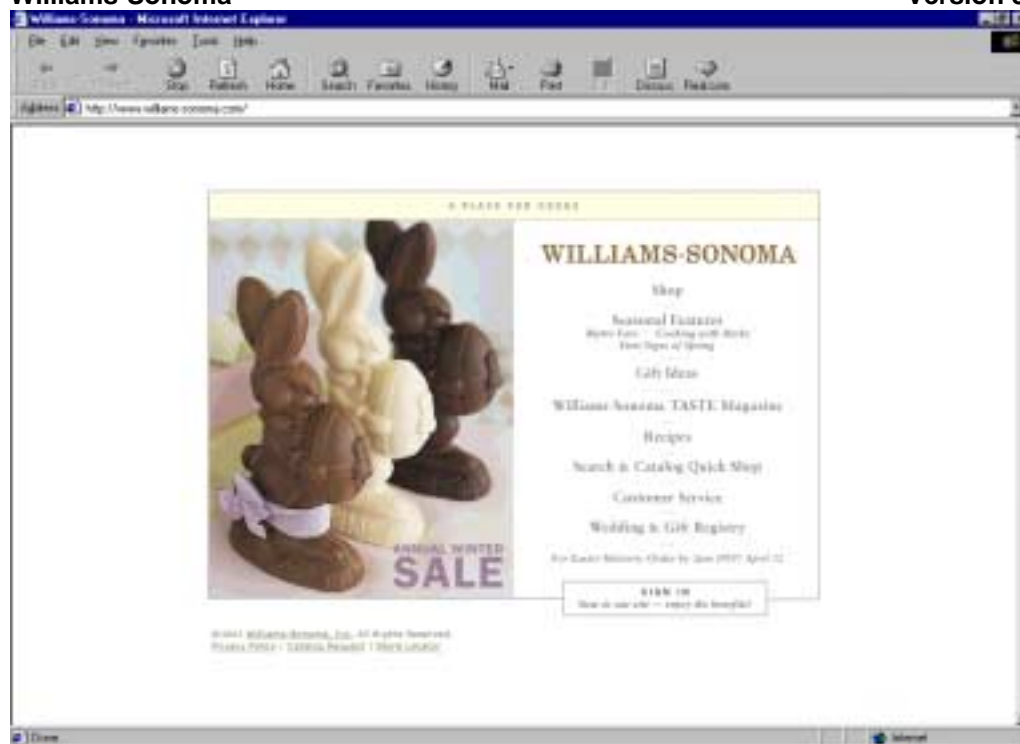
Williams-Sonoma

Version 2



Williams-Sonoma

Version 3



Cingular Wireless
<http://www.cingular.com>

Version 1



Cingular Wireless

Version 2



Raymond James
<http://www.raymondjames.com>

Version 1



Raymond James

Version 2



The screenshot displays the Procter and Gamble (PG.com) website. The header features the PG.com logo and navigation links. The main content area is divided into several sections:

- LEMON:** A section titled "WHY CAN'T THEY HELP YOU TODAY?" with a search bar and a "contact us" link.
- THINK CARE:** A section titled "Tip: need tools to help care for your family?" featuring a "BASIC HOME CARE" banner and a "Procter & Gamble's Challenge of the Week" promotion.
- HYGIENE CARE:** A section titled "Tip: need tools to make your home a healthier place?" featuring a "CLEANING, SANITIZING, DISINFECTING, AND DEODORIZING" banner and a "Procter & Gamble's Challenge of the Week" promotion.
- PERSONAL CARE:** A section titled "Tip: need tools to look and feel your best?" featuring a "BASIC SKIN CARE" banner and a "Procter & Gamble's Challenge of the Week" promotion.
- Gift Cards:** A section titled "Tip: need tools to look and feel your best?" featuring a "Gift Cards" banner and a "Procter & Gamble's Challenge of the Week" promotion.

At the bottom, there are two promotional banners: "Get a new look" and "Get a new look".



EAS
<http://www.eas.com>

EAS Performance Nutrition Backed By Science - Microsoft Internet Explorer

http://www.eas.com/

EAS.com | what's new | mailing list | contact

PRODUCTS | PRODUCTS | ORDER ONLINE | RESEARCH | EAS | TRAINING

EAS is the leader in performance nutrition for professional athletes and active individuals who combine exercise, proper nutrition and sports supplements to enhance their physical and mental performance.

Select a product for more information: | Select your transformation goal:

EAS is so confident that you will see results that your Satisfaction is Guaranteed.

FEATURED PRODUCTS	INTRODUCING	THE TIME IS NOW
<p>NEW!</p> <p>Myoplex Low Carb™ Ready-to-Drink and Nutrition Bar</p> <p>Also try the Myoplex Ready-to-Drink shakes</p> <p>EASHP The High Performance Nutrition Advantage</p> <p>NEW!</p> <p>Methoxy Factor® HP Largest bioactive ingredient available in any supplement in the world. 100% natural. 100% pure. 100% effective.</p> <p>Body-for-LIFE Body-for-LIFE Challenge 2001™</p> <p>View the complete list of Grand Champions, 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th, 59th, 60th, 61st, 62nd, 63rd, 64th, 65th, 66th, 67th, 68th, 69th, 70th, 71st, 72nd, 73rd, 74th, 75th, 76th, 77th, 78th, 79th, 80th, 81st, 82nd, 83rd, 84th, 85th, 86th, 87th, 88th, 89th, 90th, 91st, 92nd, 93rd, 94th, 95th, 96th, 97th, 98th, 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Appendix B

Interview Questions

General Questions—All Sites

1. What is your first impression of this page?
2. Where are you? How do you know?
3. What kind of information can you find or what kinds of things can you do on this site?
How do you know?
4. How easy to use do you think this site is?
5. How attractive is this site?
6. I'm going to give you several tasks. You do not actually need to find the answers to these tasks. Instead, tell me whether or not you think this site would have the answer. If you think it would have the answer, tell me how you would begin looking for the answer.
 - a. How would you find out if this company has employment opportunities that might interest you or one of your friends?
 - b. If you have a problem with something on this site, how can you let this company know?
 - c. Where would you find information about this company's financial status, such as an annual report, for example?

(See next section for site-specific tasks, listed by site.)
7. Have you ever been to this site before?
8. Have you ever heard of this company before?
9. Look around the page and tell me what you think each thing is and what you would be interested in clicking on. Why? (Where will it take you?)
10. Does this home page make you want to explore other pages within this site?
11. Does this page need more pictures and graphics, less pictures and graphics, or have just the right amount?
12. Does this page need more text, less text, or have just the right amount?
13. Does this page need more link options, fewer link options, or have just the right amount?
14. Does this page need sound?⁵
15. What do you like the most about this page? Why?
16. What do you like the least about this page and how could it be better?
17. Are you likely to visit this page again in the next six months? Why?
18. Overall, how would you describe your feelings about this page?
19. Overall, how would you describe your feelings about this site?
20. Overall, how would you describe your feelings about this company?

Tasks—by Site

Cingular Wireless

1. Does this site sell Internet access? (Where?)
2. Where would you find information about calling plans offered in your area?

⁵ In the case of Coca-Cola: "Does this page need more sound, less sound or have just the right amount?"

Coca-Cola

1. Does this site sell promotional items? (Where?)
2. Does this site have games, or music or other fun stuff? (Where?)

EAS

1. Does this site sell anti-oxidant vitamin supplements? (Where?)
2. Where can you find exercise advice appropriate for you?

Procter and Gamble

1. Where can you information about this company's newest type of shampoo and get a free sample?
2. Does this site offer hints for common dishwashing problems? (Where?)

Raymond James

1. Where would you find advice on investing in stocks?
2. If you set up an investment account with this company, how would you check on the status of those investments?

Williams-Sonoma

1. Does this site sell toasters? (Where?)
2. Where can you find meal-planning ideas for special occasions?